Improved Earthquake Safety for the Wasatch Front

Volume 19, Number 4-2003

Fault Line Forum

USSC

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Calendar of Events

FEBRUARY 2004

26-27
Utah Earthquake Conf.
Salt Lake City, Utah

MAY 2004

24-28
5th Inter-Mountain HazMat Conference
Park City, Utah

16-19
Seismic Hazards Summit II
Reno, Nevada

SEPTEMBER 2004

26-30
WSSPC Annual Conference
St. Louis, Missouri

Next issue look for more U of U Quarterly Seismicity

UTAH SEISMIC SAFETY COMMISSION MEETING MINUTES

OCTOBER 24TH, 2003 BY AMISHA LESTER

The Utah Seismic Safety Commission (USSC) held its October Meeting in Salt Lake City, Utah.

Walter Arabasz gave a presentation on the matrix meeting that was held on September 4, 2003. The matrix meeting focused on reshaping and rethinking issues within the Commission. Reconstructing and re-tasking the committees with important action items will then engage them with a common cause. A focus on the program HAZUS can become part of the framework. Another meeting will be held before the January 16, 2004 USSC meeting to further define issues and actions for 2004.

Barry Welliver discussed existing buildings project goals, which include encouraging the seismic retrofit of older existing buildings, building support for mitigation of dangerous buildings, and bringing together allied organizations to build consensus. He then described a booklet or brochure showing successful retrofit projects in Utah, and discussed requirements to inventory, study/review information, assemble status reports, and develop the brochure. Procedures are to follow with a scheduled timeframe.

The Commission held an open discussion on how to spend the 2004 Commission money. The Commission would like to support the teacher earthquake workshops, which are to be held within the coming year, by donating $1300 towards the cause. The Commission would like to spend part of the 2004 money towards ground-shaking maps for building officials. Information for the maps is to be discussed at the next USSC meeting. The Commission needs to keep in mind where and how they would like to spend other 2004 money and discuss this in the next USSC meeting.

Other Commission notes...The Utah Earthquake Conference will be held on February 26-27, 2004. The geotechnical working groups will meet on February 27th. A general earthquake session will be held the entire day of the 26th. This conference will be mainly geoscience related.

The Western States Seismic Policy Council (WSSPC) Conference that was held in Portland brought in several different presentations dealing with mitigation. One in particular dealt with the Pre-Disaster Mitigation Planning Program (PDM). DES has received seven county draft DPM plans. Utah has submitted a project for 2003 for the retrofit of the University of Utah Marriott Library, which will cost nearly

Minutes continued on page 4

Marriott Library Seismic Retrofit

The Marriott Library at the University of Utah campus is scheduled for a major renovation. In addition to updating the buildings services, a seismic upgrade is also planned which will significantly improve the structures safety is planned. The building was reviewed and found to have significant seismic deficiencies. These issues if left uncorrected could pose very serious life safety concerns for any occupants.

Two thirds of the funding for the project has been privately raised. The Utah Division of Emergency Services (DES) selected the Marriott Library project as the State's project for Pre-Disaster Mitigation (PDM) funding from FEMA. Utah DES's Hazard Mitigation Officer, Nancy Barr said "This is one of the best PDM projects under consideration for funding in the country." The State should know sometime this spring if the Marriott Library project will receive PDM funding.

State funding for the project has been approved by the State Building Board and will be subject to approval by the Utah State Legislature in the upcoming January 2004 session. For further information visit the J. Willard Marriott Library site at www.lib.utah.edu/advocate.

Comments from the Chair

By Barry Welliver, Chair, USSC

With the recent rash of seismic activity around the world and here in Utah, the issue of unreinforced masonry buildings has been on my mind and in the news.

Some images are hard to forget. Seeing a pile of bricks compressing the hood of an automobile helps me remember that each one of those bricks weighs more than I'd like to think. Throw them down at something and it's not a pretty sight. Keeping them in place is a difficult task, yet assuming that they will stay put in an earthquake is foolhardy.

There were numerous quotes in the media regarding the unsafe nature of unreinforced masonry buildings surrounding the Paso Robles earthquake deaths. (unsafe = unreinforced; safe = reinforced) They come from building officials, engineers, seismologists and shop owners. The picture is very clear yet the solutions are sometimes dragged out or ignored. Using this evidence may help motivate decision-makers in our state and hopefully we can bring about some improvements here.

The USSC press releases last month on existing unreinforced masonry (URM) buildings and the Salt Lake City School Districts' Western States Seismic Policy Council (WSSPC) award were well received. I was interviewed on KSL and Fox TV as well as Public radio about URM'S and the Desert News ran an article on the Salt Lake City School District's Seismic Design Criteria for Non-Structural Systems manual. These opportunities will hopefully serve to build upon the USSC message that things are being done in our communities and much remains to be considered

Of note is the recent (12/30/03) adoption of a Geologic Hazards ordinance in Draper, UT. Modeled after the Salt Lake County ordinance which has been in place for several years, the Draper ordinance is another example of local jurisdictions being receptive to hazard mitigation. I'll recommend the USSC endorse the work in this area at our January 2004 quarterly meeting. This is a significant issue for many jurisdictions and helping them make informed decisions and supporting these efforts should be on our agenda.

Earthquakes are what we know. Communicating that knowledge is our business.

Earthquake Hazards in Utah: Improving our Understanding

2004 UTAH EARTHQUAKE CONFERENCE
February 26, 2004

A day-long conference will be held on Thursday, February 26, 2004, to present the latest results of current research and plans for future research on earthquake hazards in Utah. The conference will be held at the Utah Department of Natural Resources building, room 1050, 1594 W. North Temple, in Salt Lake City, from 8:30 a.m. to 5:00 p.m. The target audience for the conference is earth scientists and engineers from the government, academic, and consulting sectors. Registration is free; break refreshments will be provided but not lunch.

The conference will begin with reports from the 2003 Ground Shaking, Liquefaction, and Earthquake-Induced Landslide Working Groups summarizing their plans and research needs for producing the next generation of Wasatch Front earthquake-hazards maps. The final consensus of the Utah Quaternary Fault Parameter Working Group regarding earthquake timing, recurrence intervals, and slip rates for the Wasatch and other trenched faults in Utah will also be summarized.

The remainder of the conference will be technical presentations of current research, mainly along the Wasatch Front, including: 1) the Mapleton megatrench study, 2) new investigations of the East Great Salt Lake fault and Nephi and Levan segments of the Wasatch fault, 3) the 2003 USGS deep seismic-reflection line in South Jordan, 4) shear-wave-velocity surveys for IBC site-class mapping in Salt Lake Valley and adjacent areas, 5) the latest Wasatch Front GPS-measured geodetic strain rates and their earthquake-hazard implications, and 6) earthquake-induced landslide studies in the Salt Lake County area.

The Utah Geological Survey, U.S. Geological Survey, and Utah Seismic Safety Commission are sponsoring the conference. See the UGS Web site (geology.utah.gov) for the Conference Program and Registration Form. If you have questions, contact Gary E. Christenson at 801-537-3304 or garychristenson@utah.gov. If you plan to attend, please register via the UGS Web site by February 20, 2004.

Sue Nava Leaves Utah

By Walter J. Arabasz

During the first week of August 2003, after 15 years with the University of Utah Seismograph Stations (UUSS), Sue Nava ended her career stay in Utah and moved to Melbourne, Florida, to work as a senior scientist for ENSCO, Inc., a civilian contractor involved in global seismic monitoring for nuclear treaty compliance. Sue played key roles not only in developing UUSS's real-time earthquake information system and urban strong-motion network but also in earthquake awareness and education as part of Utah's broader state earthquake program. So the "SUGAR-BOB" era comes to an end (Sue Nava, Gary Christenson, Bob Carey—the lynchpins of the partnership between UUSS, the Utah Geological Survey, and the Utah Division of Emergency Services).

A native of coastal Massachusetts, Sue came to Utah in 1988 from Memphis State University, where she earlier received an M.S. in seismology in 1983. In 2002 she received an MBA from Westminster College. Her recent MBA, her management experience, and her extensive seismological and computer expertise all gave her highly marketable skills that attracted her to new challenges—and to Florida's sunshine and beaches.

Adding up Sue's many job duties and professional contributions when it was time for her to leave put into perspective her remarkable career stay here in Utah. Her energy, clear thinking, efficiency, leadership, and being an exemplary woman geoscientist, all gained her enormous respect. And her warmth and good cheer gained her many admiring friends. Mark Twain said, "Thunder is good, thunder is impressive, but it is lightning that does the work." Look for new signs of lightning in Florida.

UNIVERSITY OF UTAH QUARTERLY SEISMICITY SUMMARY

EARTHQUAKE ACTIVITY IN THE UTAH REGION
July 1 – September 30, 2002

by Susan J. Nava
with significant contributions by Jeff Fotheringham and Fabia Terra
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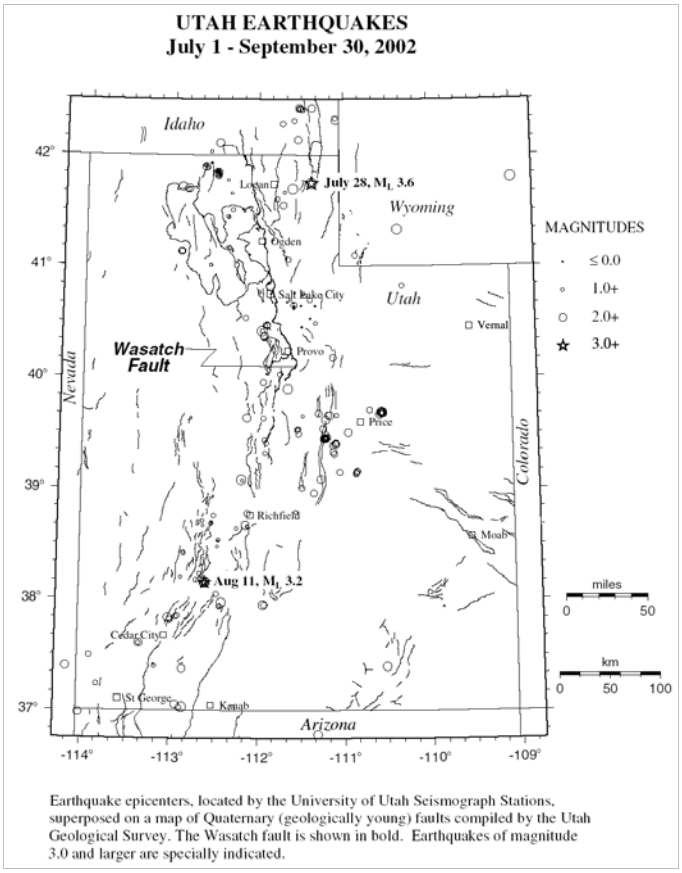

Earthquake epicenters, located by the University of Utah Seismograph Stations, superposed on a map of Quaternary (geologically young) faults compiled by the Utah Geological Survey. The Wasatch fault is shown in bold. Earthquakes of magnitude 3.0 and larger are specially indicated.

During the three-month period July 1 through September 30, 2002, the University of Utah Seismograph Stations located 245 earthquakes within the Utah region (see accompanying epicenter map). The total includes two earthquakes in the magnitude 3 range and 56 earthquakes in the magnitude 2 range. Earthquakes that have magnitudes of 3.0 or larger (plotted as stars and specifically labeled on the epicenter map) are described below. There was one earthquake reported felt during the report period. (Note: All times indicated below are local time, which was Mountain Daylight Time for the report period.) Additional information on earthquakes within the Utah region is available from the University of Utah Seismograph Stations.

Earthquakes of Magnitude 3.0 or Larger (or Felt)

ML 3.6 July 28 1:38 p.m. 12 mi WNW of Randolph, UT (felt in Laketown) (ShakeMap available, see http://quake.utah.edu/shake/archive/2002.html) ML 3.2 August 11 7:31 p.m. 9 mi SSE of Beaver, UT

Other Notable Seismicity (see map)

Northern Utah: A cluster of earthquakes occurred about 18 miles west of Garland (~35 mi WNW of Logan). These shocks (0.7 = M = 2.4) occurred on July 22. Seismic events that are densely clustered to the southwest of Price and scattered immediately to its north spatially coincide with sites of active underground coal mining in the eastern Wasatch Plateau and Book Cliffs, respectively, and are interpreted to be mining-related. These include a total of 77 located shocks.

CONTINUED UTAH SEISMIC SAFETY COMMISSION MEETING MINUTES

$57 million dollars. The University project has a good cost-benefit-ratio and strong support from the private sector.

Another issue that was discussed at this year's WSSPC Conference was the Basin and Range Seismic Hazard Summit. This will be a meeting of geoscientists and emergency managers in Reno, Nevada in May 2004.

For the WSSPC awards this year, 20-25 applications were submitted and only 10 were given. The overall winner was a brochure on being prepared that was produced as a result of the Nisqually earthquake in Washington. Nearly two million brochures were distributed for free.

UNIVERSITY OF UTAH QUARTERLY SEISMICITY SUMMARY

EARTHQUAKE ACTIVITY IN THE UTAH REGION
October 1 – December 31, 2002

by Susan J. Nava
with significant contributions by Fabia Terra and Paul Roberson
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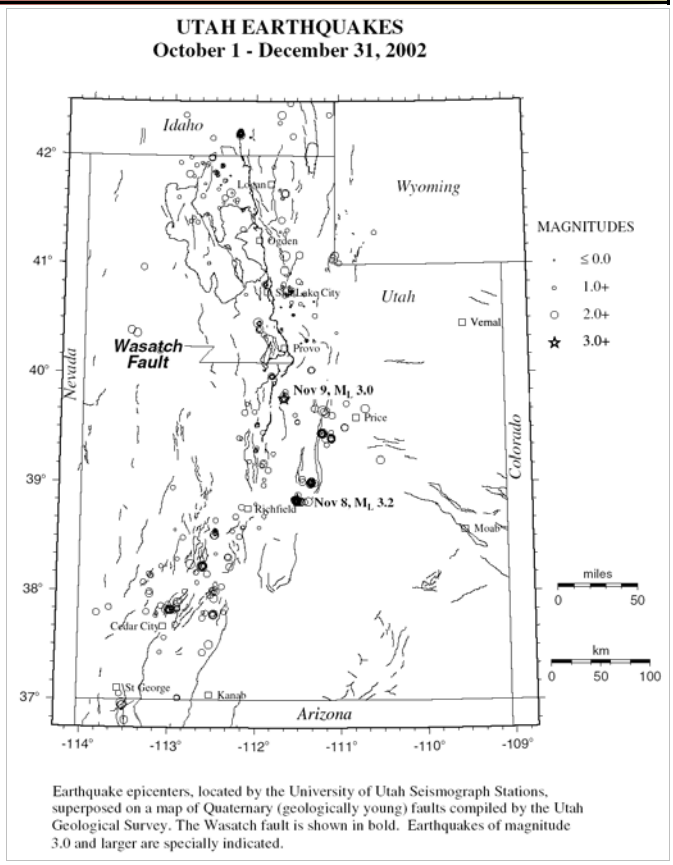

Earthquake epicenters, located by the University of Utah Seismograph Stations, superposed on a map of Quaternary (geologically young) faults compiled by the Utah Geological Survey. The Wasatch fault is shown in bold. Earthquakes of magnitude 3.0 and larger are specially indicated.

During the three-month period October 1 through December 31, 2002, the University of Utah Seismograph Stations located 445 earthquakes within the Utah region (see accompanying epicenter map). The total includes two earthquakes in the magnitude 3 range and 92 earthquakes in the magnitude 2 range. Earthquakes that have magnitudes of 3.0 or larger (plotted as stars and specifically labeled on the epicenter map) are described below. There were no earthquakes reported felt during the report period. (Note: All times indicated below are local time, which was Mountain Daylight Time from October 1 to 26 and Mountain Standard Time for the remainder of the report period.) Additional information on earthquakes within the Utah region is available from the University of Utah Seismograph Stations.

Earthquakes of Magnitude 3.0 or Larger (or Felt)

ML 3.2 November 8 5:55 a.m. 15 mi WSW of Emery, UT
ML 3.0 November 9 1:09 a.m. 10 mi NNW of Fountain Green, UT

Other Notable Seismicity (see map)

Seismic events that are densely clustered to the southwest of Price and scattered immediately to its north spatially coincide with sites of active underground coal mining in the eastern Wasatch Plateau and Book Cliffs, respectively, and are interpreted to be mining-related. These include a total of 102 located shocks. *Triggered seismicity in Utah from the November 3, 2002, Denali Fault (Alaska) earthquake:* Coincident with the arrival of the surface waves from the November 3, 2002, MW 7.9 Denali Fault, Alaska earthquake (DFE), the University of Utah Seismograph Stations regional seismic network detected a marked increase in seismicity along the Intermountain Seismic Belt in central and north-central Utah. The number of earthquakes increased from 0.26/day during the 1038 days before the DFE to 0.67/day during the 12 days after. The increase in seismicity was characterized by small magnitude events (M = 3.2). The first of these was an M2.1 event located ~20 km east of Salt Lake City, Utah, which occurred during the arrival of the Love waves from the DFE. The increase in Utah earthquake activity at the time of the arrival of the surface waves from the DFE suggests that these surface waves triggered earthquakes in Utah at distances of more than 3000 km from the source. Based on statistical analysis, we can reject with > 95% confidence the null hypothesis that the increased seismicity can be explained by stationary random occurrence. Additional information about these observations can be found in : Pankow, K.L., W.J. Arabasz, S.J. Nava, and J. C. Pechmann (2003). Triggered Seismicity in Utah from the November 3, 2002, Denali Fault earthquakes, *Survey Notes* **35** (1) (Utah Geological Survey, Salt Lake City), 11-12.

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The Fault Line Forum is published quarterly by Emergency Services and Homeland Security (DES). It makes information available to the public that may be preliminary or unavailable in other published form. It may not necessarily conform to DES policy, technical review or editorial standards. Information, contributions, questions and suggestions concerning future issues may be sent to the editor. Amisha Lester, Editor, Bob Carey, Asst. Editor, Judy Watanabe, Asst. Editor. (801) 538-3752, fax (801) 538-3772. E-mail: alester@utah.gov.

Association of Contingency Planners 15th Annual Symposium

By Kerry R. Baum

The Association of Contingency Planners 15th Annual Symposium was held October 23, 2003 with the theme: "All Disasters Are Local." There were two keynote speakers and nine breakout sessions.

The first keynote speaker was Rick Dinse, Chief of Police, Salt Lake City. He addressed "Current Events And Their Impact On The Local Community." His remarks focused on his experiences as an Assistant Chief of Police in Los Angeles during the Northridge earthquake. He related his experiences in Los Angeles to a potential event on the Wasatch Fault and encouraged organizations to prepare before the event.

The second keynote speaker, Mr. Carl Allen of InfoCore, addressed attendees on "Cyberspace Threats" and ways to avoid adverse impacts on our critical computer systems. He reported thousands of hits, daily, from hackers attempting to access one single system as recorded by security software.

Breakout sections covered most threats to business and government communities, and individuals. Bob Carey, Department of Emergency Services Earthquake Program Manager and a member of the Utah Seismic Safety Commission, provided a presentation on "Earthquakes – Response and Recovery."

More information is available at www.acputah.org.